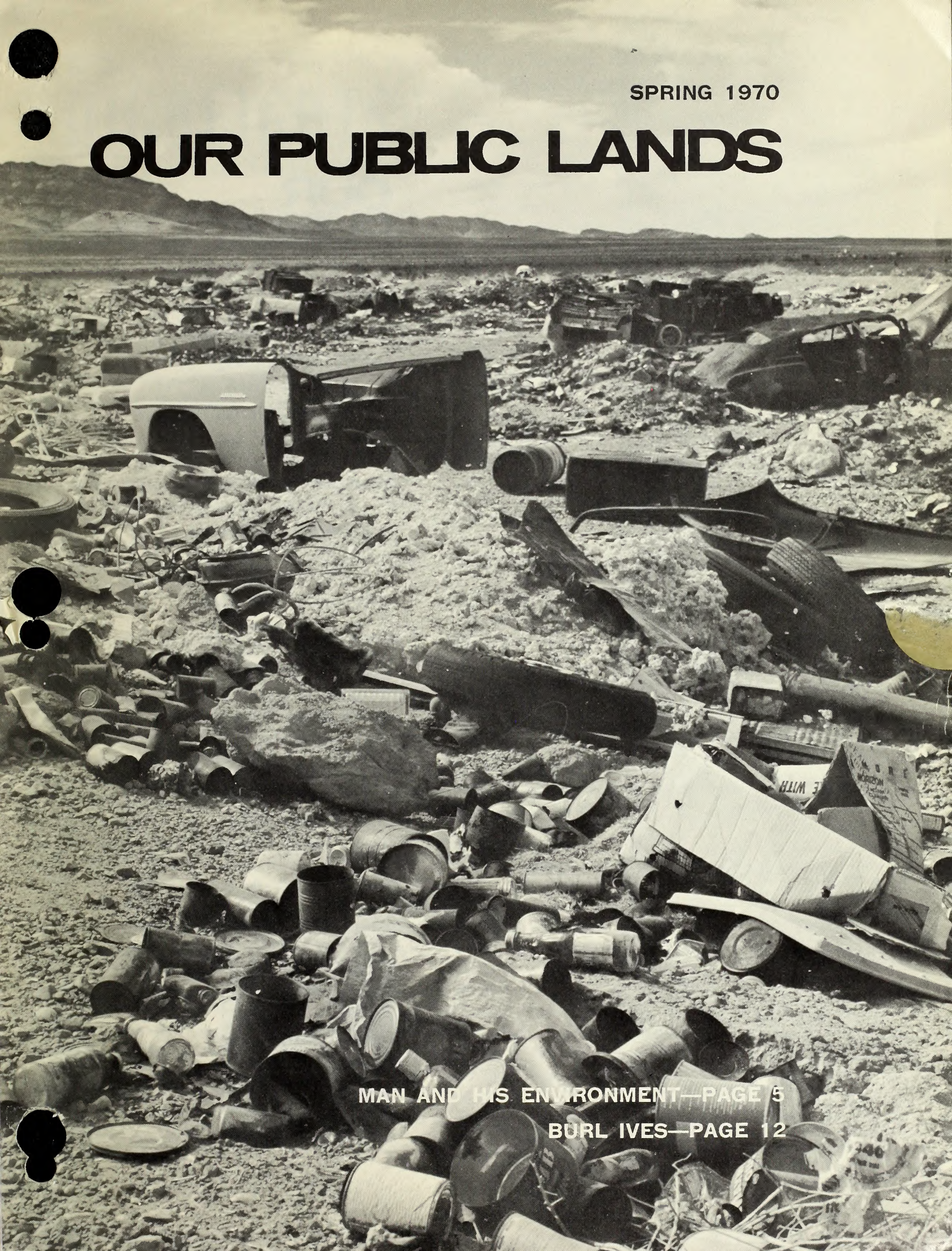
SPRING 1970

OUR PUBLIC LANDS



MAN AND HIS ENVIRONMENT—PAGE 5

BURL IVES—PAGE 12

SPRING
Vol. 20,

U.S. DEPARTMENT OF THE INTERIOR
Walter J. Hickel, Secretary

BUREAU OF LAND MANAGEMENT
Boyd L. Rasmussen, Director

As the Nation's principal conservation agency, the Department of the Interior has basic responsibilities for water, fish, wildlife, mineral, land, park, and recreational resources. Indian and Territorial affairs are other major concerns of America's "Department of Natural Resources."

The Department works to assure the wisest choice in managing all our resources so each will make its full contribution to a better United States—now and in the future.

OUR PUBLIC LANDS, the official publication of the Bureau of Land Management, U.S. Department of the Interior, is issued in January, April, July, and October.

Ed Parker, Editor

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OUR PUBLIC LANDS

Contents

MAN AND HIS ENVIRONMENT 5
By Orme Lewis, Jr.
The American challenge

A DEATHTRAP NO MORE 9
By Mary Bowen

PUTTING WILDFIRE ON TV 10
By Harold B. Grayson
Looking for a breakthrough

GENTLEMAN'S AGREEMENT 12
Burl Ives and Johnny Horizon: Partners

BLACKSMITH'S COMEBACK 14
By Robert C. Mitchell
Revival of a craft

JUST DESERT AND ROCKS 16
By Shirley Gumert
Notes from the distaff side

MINING AN UNUSUAL MINERAL 18
By Gerald A. Huff
A resource unique to Utah

LAND LAW REPORT 21

PUBLIC SALE BULLETIN BOARD 22

The Cover

Land pollution near Las Vegas, Nev.

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HIGHLIGHTS

President Nixon Praises Coloradan's Efforts To Reduce Air Pollution

Robert Monson, president of Colorado Studs, a sawmill in Montrose, Colo., has received a letter from President Nixon commending him for his efforts in reducing air pollution and improving the conservation of natural resources.

President Nixon wrote, in part: "I understand that the landfill system which you have developed adds fertility to the soil and helps to halt erosion through filling of gullies. The leadership and foresight you have demonstrated merit the gratitude of your fellow citizens and I hope your initiative will enlist others in the effort to preserve and enhance our living environment."

Monson's program of burying mill wastes instead of burning them was reported in "Burying Sawmill [illegible]ke." *Our Public Lands,* Fall 1969.

155 Mining Claims on Oil Shale Lands Voluntarily Relinquished by Holders

The Department of the Interior has announced that 155 mining claims on oil shale lands in Rio Blanco County, Colo., have been relinquished voluntarily by their holders in what could be an important step toward development of Federal oil shale resources.

The claims, covering 22,781 acres, were relinquished by the Atlantic Richfield Co.; Pan American Petroleum Corp.; Cameron Engineers, Inc. & Associates; and the Oil Shale Corp. (TOSCO).

The relinquished claims, all filed within recent years, are generally termed "dawsonite" claims. Dawsonite, a compound of sodium aluminum carbonate, is intermixed with oil shales in parts of Rio Blanco County. Before BLM can develop an oil shale leasing program it must first clear the title to oil shale lands clouded by these claims. Voluntary relinquishment relieves the Bureau of the necessity for instituting time-consuming legal action to accomplish this.

BLM officials say there are still 4,257 so-called "dawsonite" claims on file in Rio Blanco County, and 2,504 of these are being contested by the Government. [illegible]her voluntary relinquishments are expected.

BLM'er Teaches First College Course Ever Offered in Wildlife Habitat Management

James D. Yoakum, Wildlife Specialist in BLM's Nevada State office, made academic history this winter at Colorado State University when he taught the first college course ever offered in wildlife management.

"The beginning of this course at Colorado State, which has the largest enrollment of wildlife students in the world, is a major step for the science of wildlife habitat management," Yoakum said. Wildlife habitat is a significant part of any resource management program but, as a study, it has not been a part of university curriculums.

Yoakum, who was given a leave of absence from BLM, has been in charge of the Bureau's wildlife program in Nevada for 10 years. In 1964–65 he was guest lecturer in wildlife management at Humboldt State College, Arcata, Calif., which is second only to Colorado State in number of wildlife students. In 1968 he served as a consultant in wildlife management on a special Government mission to Peru (see "Viva la Vicuna," *Our Public Lands,* Summer 1969).

BLM Publishes Placer Examination Handbook

BLM has released the fourth in its series of technical bulletins. The publication, "Placer Examination, Principles and Practice," was written by John Wells, of Sacramento, Calif., the Bureau's placer mining specialist, who has spent most of his career in placer mining and is recognized by industry and government as an authority in the field.

Wells wrote the book to help mineral examiners evaluate placer claims. BLM Director Boyd L. Rasmussen said that the book will be a valuable reference to professionals and students of mining engineering.

$25 Million in Public Land Payments Distributed to States and Counties

More than $25 million has been distributed to 23 States and 18 counties that share in funds from Federal lands administered by the Bureau of Land Management.

Of the total, more than $24.8 million was paid to States out of revenues from mineral leases for the 6-month period that ended December 31, 1969.

In addition to the allocations to the States, BLM paid over $227,000 to certain western counties under the provisions of the Bankhead-Jones Act. The payments represented the counties' share of money collected during calendar year 1969 from grazing leases, mineral leases, and other user fees.

Interior and Agriculture Join Forces To Save Rare California Condor

The California condor prefers to live among the wild and lonely mountain heights of the Los Padres National Forest in California. Photo by Bureau of Sports Fisheries and Wildlife, U.S. Department of the Interior.

In a new move to help save the California condor, Interior Secretary Walter J. Hickel has ordered a halt to all further oil and gas leasing in the Sespe Condor Sanctuary.

The 53,000-acre sanctuary, part of the Los Padres National Forest in California, is administered by the Forest Service, U.S. Department of Agriculture. It is the only known nesting area for the condor which is placed high on Interior's endangered species list.

With a wingspan that sometimes reaches 9 feet, the California condor is America's largest bird in flight.

The Secretary directed BLM, which supervises mineral leasing on Federal lands, to declare an indefinite moratorium on leasing in the sanctuary until wildlife experts from Interior and Agriculture can complete research on increasing the condor population.

In a letter to the Secretary of Agriculture, Clifford M. Hardin, Secretary Hickel called the moratorium "an opportunity for our Departments to cooperate closely in preserving a rare and endangered species; an opportunity which should not be missed."

Earlier efforts to save the condor from extinction resulted in the establishment of the sanctuary in 1951. Oil and gas leasing were allowed, however, and there are two producing oil wells in the sanctuary. Officials in Interior's Bureau of Sport Fisheries and Wildlife say the number of condors is smaller now than in [illegible] and attribute this to poor reproduction which is so[illegible]times caused by nearby loud noises such as blasti[illegible] Disturbances can cause the birds to leave their nests during critical incubation periods.

Condors now number between 60 and 80, and wildlife experts say the bird's future is very much in doubt. Only 11 attempts to nest have been made in the last 3 years, and only five of these were successful.

OCS Leases Bring $66.9 Million

Sixteen tracts on Louisiana's Outer Continental Shelf brought $66,908,195.50 in successful bonus bids at an oil and gas lease sale at New Orleans in December 1969.

Some of the tracts are draining into adjacent tracts where there are producing wells, and some are expected to become subject to drainage in the near future. Other tracts in the sale were offered to stimulate exploration and development in areas where additional reserves need to be proved in order to justify the construction of pipelines.

The sale was the last of three sales scheduled by BLM to sell a total of 92 offshore tracts covering some 237,400 acres of submerged land.

MAN AND HIS ENVIRONMENT

The American challenge

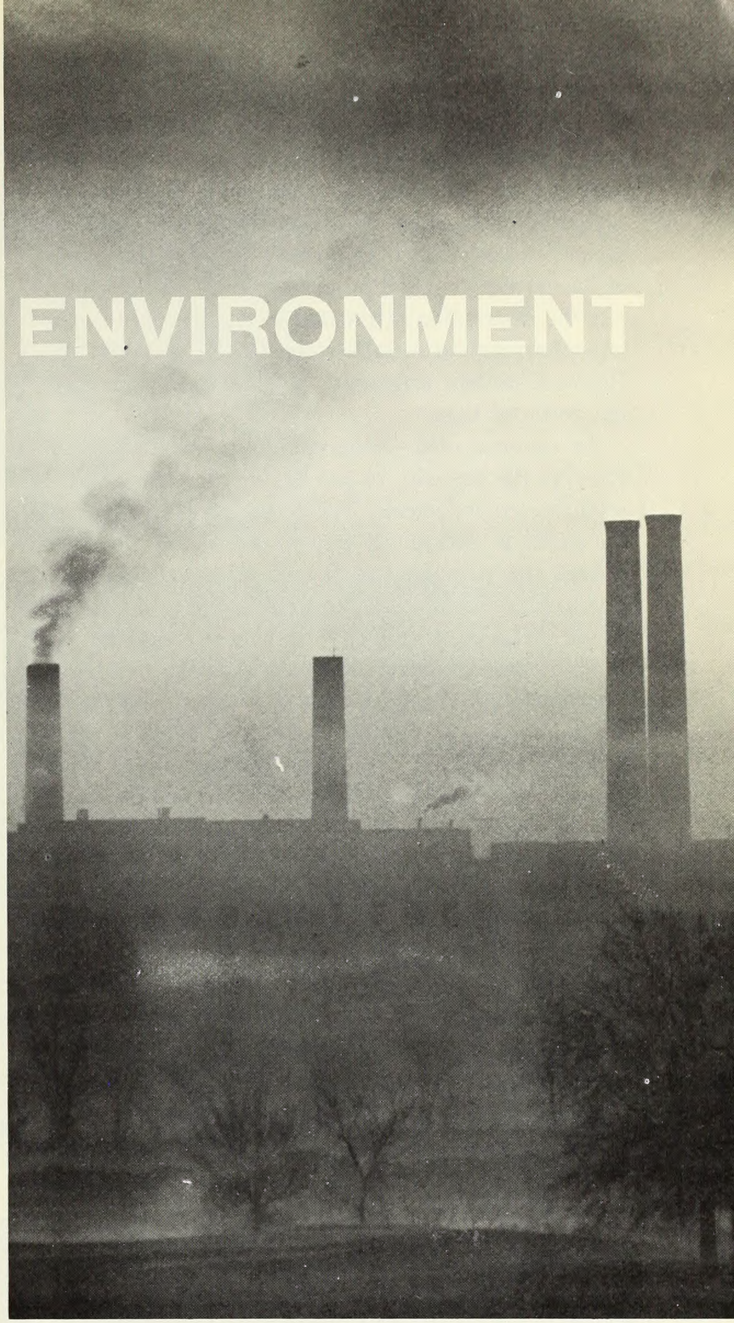
Extracted from a paper presented by Mr. Lewis to the Council of Europe Conservation Conference, February 9–12, 1970, Strasbourg, France.

A PHENOMENON of our time is the worldwide realization that man is inexorably restricted by ecological laws. He has suddenly realized on a worldwide scale that his lack of concern for these laws can [illegible]minate his species, just as the great reptiles disap[illegible]ared as their position deteriorated millions of years ago. Although civilizations in the past have succumbed to, or collapsed from, violations of their ecological situation, it has been the great increases in our numbers and the explosive rise in the effectiveness of our technology that have brought the full import of those principles on human survival and the resulting dilemma of survival to practically universal attention.

Two facts relating to this matter are of particular significance. The first is that we have limited knowledge of the nature and extent of the results of environmental changes. It is becoming more clear daily that the interdependence of living things and their dependence on natural relationships are far more complex and critical than we have imagined. We know now that the scientific community must delve much deeper into the problems of its disciplines, and that the political community must dedicate greater concern for the consequences of its actions if mankind is to survive as a quality organism.

A second fact that has come to the fore is that changes caused by environmental tampering are often irreversible or, at best, very expensive to check.

By **ORME LEWIS, JR.**
Deputy Assistant Secretary, Public Land Management
U.S. Department of the Interior



The by-products of economic activities present ecological dangers.

Need for Planning

These developments and factors have contributed to the increasing emphasis political authorities have been placing on the need for social, economic, and political planning. With respect to natural resources, current discussions have added a "crisis" dimension to concerns for land-use planning and its tools of land classification and zoning.

An obvious conclusion is the need to intensify planning for land uses. Of equal importance, however, is the need to expand the geographical coverage of integrated planning to the extent, in some cases, of planning on an international level. The need for this expanded outlook can be illustrated by looking at two aspects of environmental damage: (1) The destruction of the capacity to produce particular commodities, and (2) the destruction of the capacity of people to maintain a harmonious social system. The question remains: How can we best safeguard the environment and meet the needs of man?

An example of the geographical implications of destroying the capacity to produce is the destruction of estuarine environments. There are some who feel that the world is well on its way to destroying all marine animal life through the "beneficial development" of estuaries. Another example is the creeping destruction of our richer agricultural areas by our constantly burgeoning urban conglomerations. The growth of these urban areas is also producing increasing evidence that human beings have a limited capacity to adapt to crowded conditions. This leads to the need to plan beyond the immediate limits of our cities so as to relieve the pressures of intense urbanization by transplanting parts of the population, or by providing ready accessibility to recreative open space—or both.

The twin characteristics of complex interdependence and wide geographical impact have been factors in the suggestions of the Secretary of the Interior, Walter J. Hickel, regarding the establishment of a Department of Natural Resources and Environment and the expansion and identification of land-use planning. In his mind, the time for fragmentation and partial measures has long since passed. In reaching this conclusion, he has faced squarely the basic problem of the race between development and survival. The dilemma which he brings to our attention is that development is essential to survival but, at the same time, it is a threat to survival. He thus emphasizes that we must strike an appropriate balance between planning and action if we are to increase the probabilities of overall success in our efforts. His cautious but vigorous approach to the approval of a right-of-way for an oil and gas pipeline across the delicate lands of Alaska, and his similar approach to leasing of the Outer Continental Shelf for petroleum development are examples of this need for balance.

Planning Steps

Theoretically, there is an obvious sequence of steps for land-use planning. The first step is to inventory all resources. The second involves the identification of the possible uses of the inventoried resources. The next step is to determine the degree of compatibility of the various uses and the selection of those uses which p[illegible]duce the "optimum mix" of products. (This involves the application of social values.) The final planning step is classification and zoning.

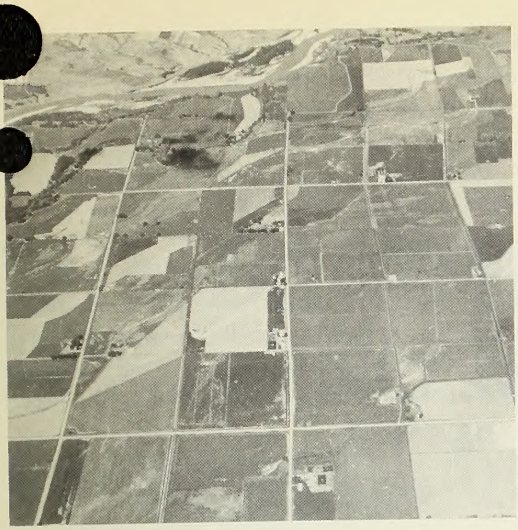
The practical problem faced by the Secretary of the Interior and all other resource managers is that at no time do they have available all the facts and techniques needed to make the best possible decisions. At the same time, they would threaten the survival of their constituents if they withheld development until all the facts are in.

The basic problem is tackled by introducing certain fundamental concepts into the planning procedures. An important concept in this respect is for the planner to remain flexible by not committing himself prematurely to a project which would have irreversible consequences or which would have results that would be unduly expensive to correct. This requires a determined effort to foresee the consequences of a projected action and a conscious desire to withhold approval if the consequences are unacceptable or if lack of information prevents the kind of analysis needed. This does not eliminate risk but can reduce it to acceptable lev[illegible] This flexibility also has important implications for l[illegible] use classification restrictions and zoning. It calls f[illegible] classification systems which reflect the various degrees of commitment to specific uses, running from complete flexibility for change to complete dedication for a specific use for an appreciable period of time.

This concept is likely to be observed by land managers operating under principles of multiple use. At the present time, however, it is widely overlooked by zoning officials who feel that they are providing flexibility by establishing "multiple use districts." The terms and conditions of land use in such districts usually permit, without ample consideration of the consequences, land uses that result in irreversible consequences. Zoning officials need to heed the warning of the Secretary that land use planning must be raised to a level consistent with the challenges that face the world.

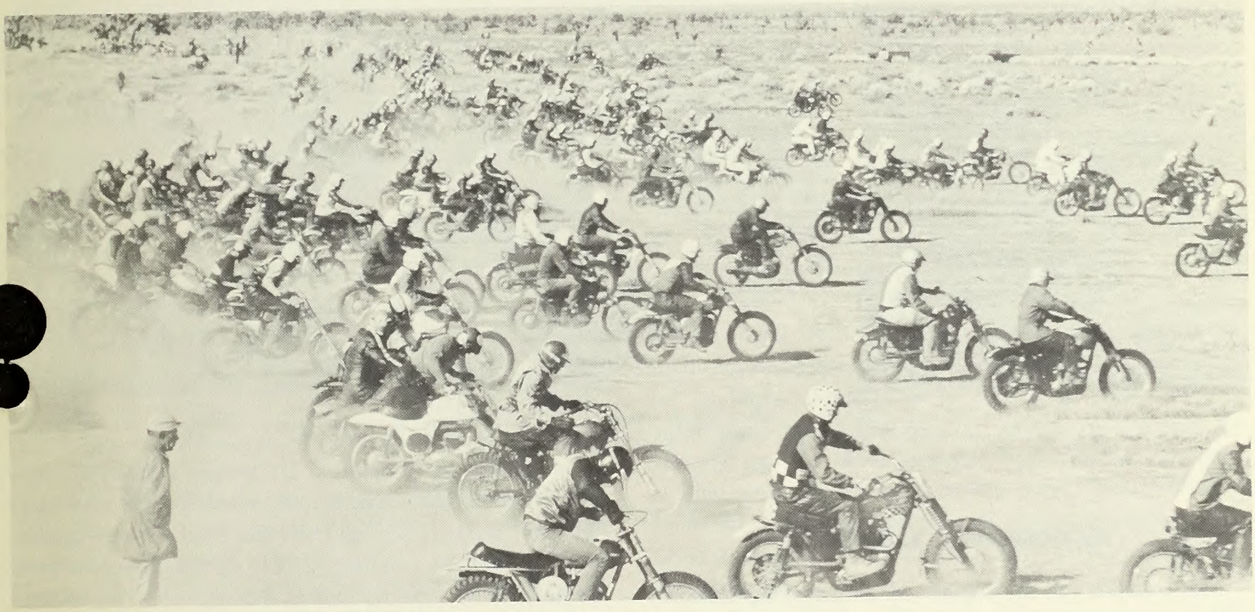
Public Participation

Another concept which has enjoyed growing appreciation in the United States, as well as incorporation into Department of the Interior procedures, is the inclusion of the general public in the decision-making process. The chances of overlooking important relationships or unsuspected effects are reduced to the ex[illegible]

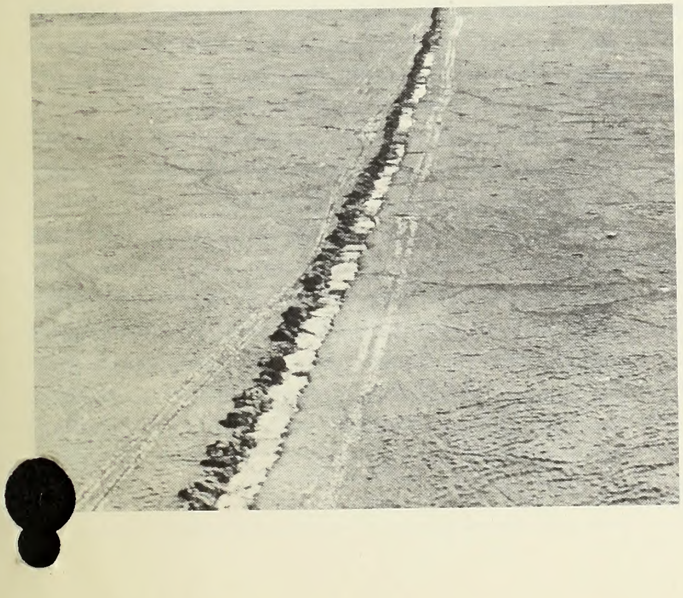


Our richer agricultural areas need protection from urban growth.

The first step in land-use planning is to inventory resources.



The pursuit of leisure poses problems in resource management.



". . . our constantly burgeoning urban conglomerations."

The Alaskan tundra—"Man . . . practically no place in the world is inaccessible to him and his power equipment."

that knowledgeable people are brought into discussions before decisions are made. An all-important byproduct of this participation is that classification and zoning decisions are more likely to receive public support and to remain stable when the public participates in making the decision.

Another important principle is to maintain surveillance of the classification process itself to insure that it is meeting the needs of the times. Established procedures too often tend to become ends in themselves and sometimes become unwittingly obsolete. The effectiveness of procedures should be constantly checked and changes should be introduced as soon as weaknesses are discovered.

As manager of a large percentage of the open space of this Nation, the Secretary of the Interior has enormous opportunities and responsibilities for the management of the country's ecology. In his management of this vast public estate, he is bringing into consideration all elements which relate to the optimum relationship between man and his environment.

As indicated above, he is much concerned with the impact of urban conglomeration from the point of view of both man himself and the production of natural resources. He is exploring the opportunities for new towns on the public lands to provide a better pattern of urban living for a vigorous population. He has called for a more complete inventory and classification of the Federal lands to permit wiser land-use decisions for all Federal properties, taking into full consideration both the material and physical needs of man himself.

Management Objectives

His concern for the impact of industry, agriculture, and forestry is also manifold. Here his concern is not only with the type of land use or uses, but also the techniques and procedures for reaching these use objectives. Objectives in managing resources include maintaining sustained-yield production, minimizing adverse effects on other resources, enhancing other resources wherever possible, and maintaining the quality of the environment.

We have long since passed the time when conscious exploitation of resources without respect to detrimental effects has been acceptable in the United States. What has taken us by surprise are the often hidden and offsite deleterious effects of accepted practices. A dramatic example is the far-reaching disaster from the use of the very pesticides which have been so important to the increase of our farm productivity. Other byproducts of economic activities which are receiving attention because of their ecological dangers are the disposa[illegible] heat from power production and manufacturing processes; carbon dioxide produced by various forms of energy and the changed balance of vegetation co[illegible]pared to animal populations; chemical byproducts of mining and manufacturing; site destruction by the construction of buildings and facilities, and by mining, roadbuilding, and other activities; and the storage of wornout and damaged property—wastes and litter—which are being produced in prodigious amounts. Such deleterious effects of development not only indicate how dependent we are but also demonstrate the necessity for a proper balance.

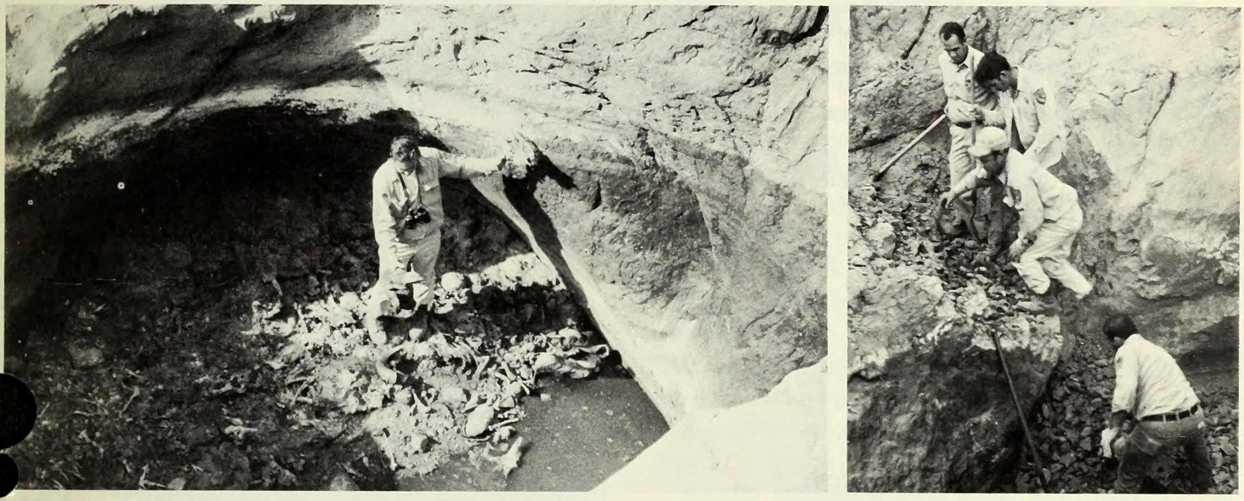
The Impact of Man

The pursuit of leisure by an ever-expanding population in a highly developed technological society is a threat to our natural resources of rapidly increasing intensity. Powers of destruction in the hands of individuals today are many: increased firepower, mobility power, and power machinery of all kinds. Man can now adapt to any season of the year and practically no place in the world is inaccessible to him and his power equipment. Uncontrolled, he has the power to eliminate most species of the larger animals. Un[illegible]trolled, he can destroy, in a relatively short time, [illegible] delicate environments of desert and tundra. And as l[illegible]sure and technology increase, he is getting the time and means to produce large-scale environmental damage as a byproduct of recreation. By proper education, good government, and sound management, people may benefit from science. But on the other hand, future generations could be consumed by development without balance.

Thus, it is clear: in man's pursuit for a better life lie the seeds of his destruction. This results from the fact that man cannot impact the environment to an appreciable extent without changing the course of life. It is not clear whether man has the ability to adapt to a greatly modified environment. But it is a hard fact that man now has the ability, through sheer carelessness, to foreclose his survival.

This can be man's choice. Fortunately, there still appears to be time for man to change his ways by respecting his environment and by making wiser use of its resources. This means that all governments must embrace, as one of their prime objectives, the integrity and quality of the environment. They must all treat that part of the environment that is under their control as a sacred trust granted to them by all future generations. ☐

A DEATHTRAP NO MORE



Left: The rock wall of the natural cistern shows its normal water level. Richard Weaver stands at the bottom of the 10-foot deep hole. Right: Riohard Weaver scrambles up the completed escape ramp. Others are, life to right, Jerry Mensch, John Colby, and James Maddox.

A WATERHOLE in the remote Chocolate Mountains of southeastern California will trap no more bighorn sheep. The waterhole was a naturally formed cistern in a rock formation that would fill with water during desert cloudbursts. When the water level dropped, however, bighorn sheep that attempted to drink would fall in and be unable to get out.

California Department of Fish and Game Biologist Richard Weaver, in charge of the wildlife team that discovered the waterhole, sought the assistance of U.S. Bureau of Land Management personnel who administer the area. Together they planned to provide an escape ramp from the waterhole. A Bureau of Land Management work crew set out on foot for the remote area. A helicopter was required to bring in rock-drilling and blasting equipment. The men went to work along one of the sheer walls of the deep hole, chiseling and dynamiting until a safe access ramp had been completed to the bottom of the former deathtrap.

By **MARY BOWEN**
Folsom, Calif.

The remains of the drowned sheep were collected from the bottom of the natural cistern. Evidence indicated that at least 34 desert bighorns had died there in recent years.

Weaver and the other investigators, John Colby, Jerry Mensch, and Fred Worthley, began work in the summer of 1968 to investigate the status of bighorn sheep in California and to formulate management recommendations.

Bighorn sheep once roamed extensively in California. The encroachments of civilization, however, have eliminated them in all but the most rugged and remote areas of the southern part of the State. Present conservation practice includes efforts to safeguard the sheeps' water supplies and to provide water sources when necessary. Alteration of this one waterhole will end forever the needless deaths of these scarce wild sheep in its trap. ☐

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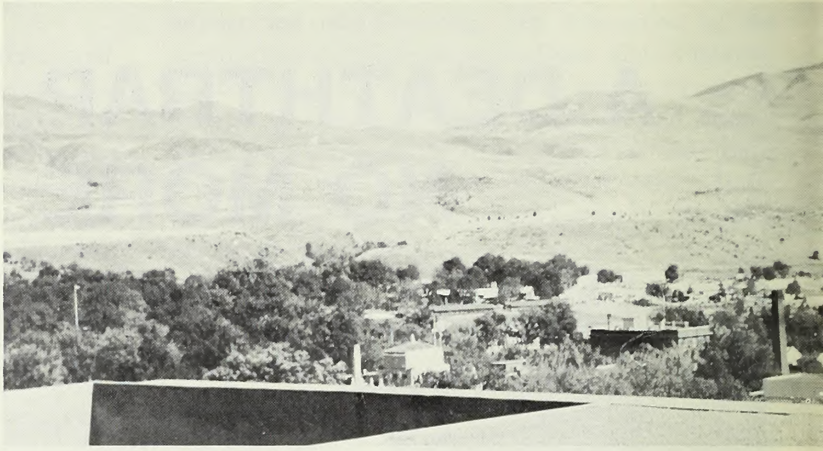
PUTTING WILDFIRE ON TV



A portion of the Boise Front as seen from the camera position on top of the Bank of Idaho building.

Looking for a breakthrough

ON AUGUST 3, 1959, two small grass fires started on the steep slopes of the Boise Front watershed just beyond the city limits of Boise, Idaho. Then, blazing out of control, wildfire swept across the Front, burning some 10,000 acres and leaving the foothills barren of vegetative cover.

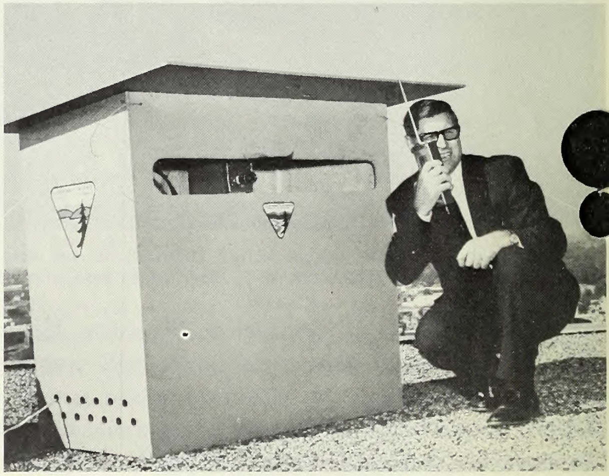
Seventeen days later a summer rainstorm struck, and torrents of water washed tons of mud, rock, and debris from the unprotected slopes onto outlying sections of Boise. Before cleanup could begin, another cloudburst hit.

Disaster.

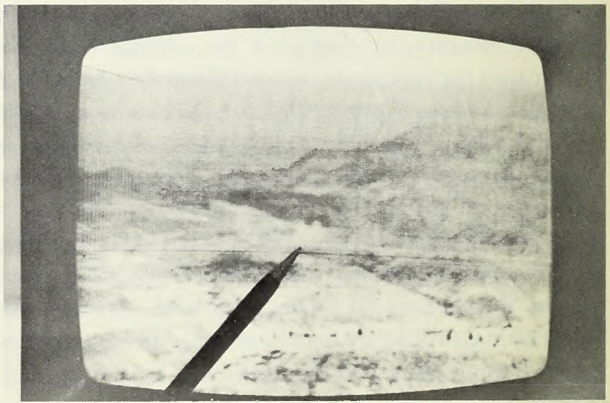
It cost thousands of dollars to put out the fire and control the flooding, to clean up the mud and debris and repair flood damages, and to rehabilitate the fire-damaged watershed.

By **HAROLD B. GRAYSON**

Information Specialist
BLM State Office, Boise, Idaho



At the camera position, John Barkdull checks with the Fire Dispatcher's Office.

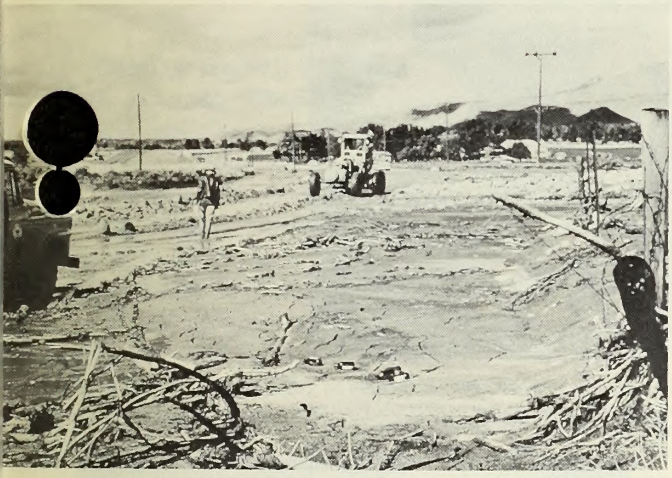


A test smoke as it appeared on the monitor screen.

Could the disaster have been avoided? "With immediate detection and attack it could have," says John Barkdull, BLM's electronics engineer in Boise, "but immediate detection requires constant surveillance."

While it is not possible to maintain a constant watch over all the vast areas of the public lands, Barkdull for some time has felt there must be a way to protect key areas—the Boise Front, for example.

No organized fire-detection system exists specifically for the Boise Front watershed. Detection is the result of reports by aircraft pilots, private citizens, and control tower personnel at the Boise Airport. Usually these fire reports are telephoned to the city or rural fire departments, the Boise police, the Ada County Sheriff's office, or the U.S. Forest Service, and then relayed to BLM. Initial information is generally sketchy, thereby tending to slow down immediate fire-suppression tactics. Barkdull has been seeking an inexpensive but more advanced detection system through the use of television equipment.



Aftermath of the floods that followed the 1959 fire.

Readily available commercial-type television systems could do the job, but they are too expensive. These microwave, or closed-circuit systems, require special lines. But recently, several companies also have realized the need for an inexpensive long-distance video system at would use less-expensive transmission equipment. rkdull, after seeing a demonstration of a system using regular telephone lines, proposed using the equipment in an experimental test on the Boise Front.

BLM rented the necessary equipment and, in August 1969, installed it on the roof of the Bank of Idaho Building with the cooperation of the Trammel Crow Co., owners of the building. The camera, sweeping from left to right and back again, scanned an area of the Front some 18 miles wide and provided complete surveillance of the area every 6 minutes. The picture information from the camera went over commercial telephone lines to a television monitor screen in the fire dispatcher's office in BLM's Boise district office.

Several experiments were conducted, with smoke bombs used to simulate fires. An observer was stationed by the TV camera on top of the bank building, and as soon as he could visually detect the smoke he photographed it. Photographs were also taken of the TV screen in the dispatcher's office the instant that smoke could be identified on the monitor. The time of the sightings were recorded and compared to determine how long it took to interpret smoke on the TV screen.

Results were most promising. The dispatcher was able to recognize smoke only 30 seconds after a bomb was set off. This was in spite of the fact that the gray of the smoke on the black and white television screen was similar in appearance to the gray of the background vegetation on the foothills.

Barkdull concluded after further testing that the general type of equipment used in the experiment offers definite opportunities for developing a television surveillance system. Such equipment can transmit over long distances by any voice-grade communication circuit like readily available telephone lines. In addition, BLM's present VHF/FM and UHF/FM radio systems could be used with only slight modifications. And finally, inexpensive, high-quality color transmission is possible. This would provide better contrast between smoke and background than black-and-white transmission.

The perfection of this or a similar system will be a major breakthrough in the detection of wildfire. More important, it will provide still another tool that can be effectively used in protecting the public lands and their resources on the Boise Front and in other key areas. ☐

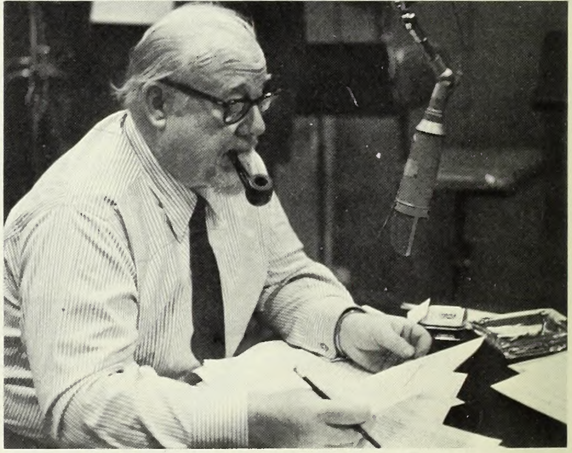
Gentleman's agreement.

At the National Press Club.

GENTLEMAN'S AGREEMENT.

Burl Ives and Secretary Hickel enjoyed a group of Washington area school children singing a new song about Johnny Horizon.

Mr. Ives said this country has been good to him and he wants to do something for it.
"My old guitar pickin' finger has been good to me, now I'm ready to offer my services in whatever way I can."



Burl Ives calls for environmental improvement. Recording Johnny Horizon spot announcements for radio in a New York City studio.

He's traveled the land over the years, singing the songs of East and West, North and South. He's walked the Nation's main streets and its dusty byways, and he knows the people along them as well as anyone—and he knows the land. But now . . . now there on the land he's crossed so often, the sun no longer shines so brightly, and the air and the water are not clean. So he stopped by Washington, D.C.

"I'd like to help," Burl Ives said. "I'd like to help any way I can."

Burl Ives and Johnny Horizon Partners

Burl Ives meant it when he said he'd like to help any way he could. When he stopped by Washington he talked with Secretary of the Interior Walter J. Hickel and Boyd L. Rasmussen, Director of the Bureau of Land Management. He told them that he'd like to help in BLM's Johnny Horizon cleanup program and other environmental efforts of the Department. And they shook hands on it in a gentleman's agreement.

"If the seventies are sounding a challenge to the Jeffersons and Franklins and John Muirs amongst us to come to the rescue of our good earth . . . I'll be there, singing and talking," he said. "And everyone in the country will be with us."

He pointed out that young people are saying let's make the world a better place, and that he thinks everybody "is raring to go." They can all help through the Johnny Horizon program by taking part in litter cleanup campaigns and other action projects that can make our land a better place. He said the land "is the root of everything we are; taking care of it is a matter of utmost importance."

Secretary Hickel said that the quality of the national environment has been rapidly deteriorating because of land, air, and water pollution, and emphasized that the Johnny Horizon program is in the forefront in efforts against land pollution.

The Secretary added, "We are honored and delighted to have Mr. Ives as a partner in this significant program of litter prevention and cleanup. Burl Ives' ballads of the land, the people, and their heritage have endeared him to an entire nation. His musical interpretations of our national folklore clearly reflect his love and respect for the land."

Mr. Ives also met with national leaders in conservation, Members of Congress, and representatives of the communications and entertainment media at the National Press Club. He spoke of the "beautiful great land" as it was 40 years ago and as it is today, and he said, "That's why I am here, and I will do what I can." ☐

King-size clippers are needed to cut through the horse's tough "toenail."

BLACKSMITH'S COMEBACK

Revival of a craft

THE RINGING HAMMER of the village blacksmith once was heard in villages across the Nation—even where there was no spreading chestnut tree to shade the smithy.

And although the ring of hammer on iron and anvil is seldom heard today, the skill of the blacksmith as a shoer of horses is still much in demand.

The number of privately owned horses in this country is increasing, perhaps because they represent a spirit of adventure that makes many people want to own one. Whatever the reason for the increase, the blacksmith—the British term is farrier—who went out with the bu[illegible] whip is now making a comeback.

By **ROBERT C. MITCHELL**

Wildlife Biologist
BLM District Office, Burns, Oreg.

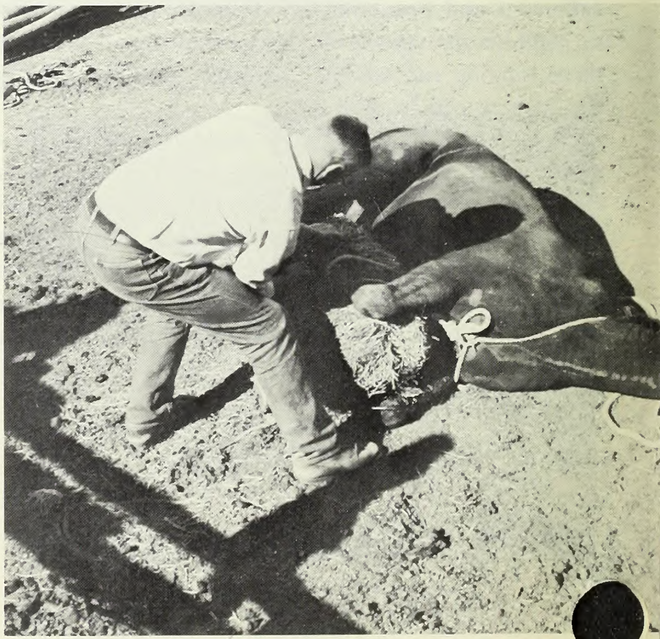
A man who should know is Robert F. Wiseman, a BLM range conservationist in the Burns District. [illegible] also is an expert horse trainer and an accomplished farrier who completed a study program in horseshoeing at Montana State University. As Bob puts it, "Everybody thought we were extinct. Fact is, we're doing quite well, and several manufacturers are now producing horseshoes and farrier's tools—a business that was largely abandoned in the thirties."

The demand for expert farriers at present exceeds the supply, although about a dozen schools throughout the country are now teaching the craft. Wiseman says that the work is hard but the pay is good, and the field is attracting many young men and more than a few women.

Wiseman keeps his horseshoeing skills sharp by shoeing the four horses that the Burns District keeps under contract for use in traveling roadless back country. Three other BLM districts in Oregon which periodically use horses keep 15 under contract, and a fourth district owns three horses.

Horses Need Shoes

Horses need to be shod for a number of reaso[illegible] horseshoes protect the feet and keep them from getti[illegible] tender; different types of projections added to the bottom of shoes give the horse a surer grip; and various types of shoes can be used to correct defects of con-



rmation and gait and to aid healing in case of injury.

Once a horse is shod, however, he's not through with the farrier for good. A horse's hooves keep growing like human fingernails. They must be trimmed and the shoes must be reset periodically—about every 2 months—to guard against damage to the feet. Since shoeing retards expansion of the foot to some extent, it is a necessary evil, and horses should be allowed to go "barefoot" as much as possible.

Like other crafts, horseshoeing requires special equipment. The minimum number of tools needed to shoe a normal horse are a hoof knife, rasp, nippers, fiting hammer, nailing hammer, and an anvil. The anvil should be a special horseshoeing type with a thick horn and a thin arch end. The farrier also needs a strong halter, a lead rope, and ropes for throwing the animal.

Iron shoes are most commonly used, but horseshoes are also made out of steel, rubber, aluminum, and plastic. The shoes are nailed to the hoof in such a way that the nails do not penetrate the sensitive inner tissues but are driven through the outer wall. The ends of the nails are then cut off and the stub bent over to form a clinch which holds the shoe securely. The special nails that are used have a beveled point that causes them to bend outward as they are driven. Properly driven nails emerge through the wall about an inch above the shoe.

Before the shoes are nailed, the feet are trimmed with nippers and rasp until they are balanced and level. Shoes are then fitted to each hoof, made perfectly level and nailed on.

Hot and Cold Shoes

There are two methods of shoeing: hot and cold. Hot shoeing is necessary in special cases; for example, compensating for foot defects. Shoe blanks are heated in the forge and the malleable iron is then carefully adapted to fit each hoof.

Cold shoes are finished shoes that are ready to be fitted and nailed without heating. This is the more common method used today. The equipment and degree of skill required by cold shoeing is less, and cold shoes are adequate for the average horse.

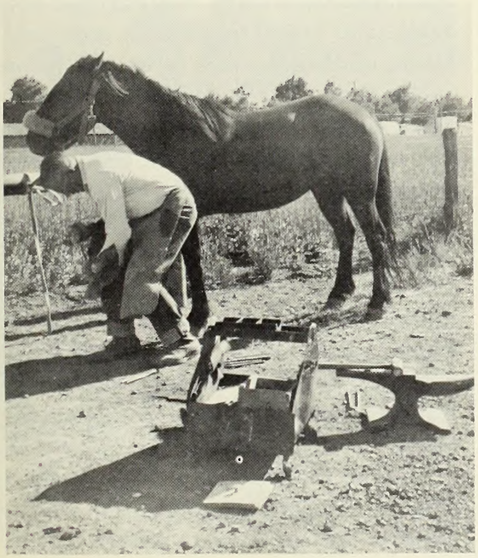
How does the horse feel about all this? Bob Wiseman says that by using ropes and the proper techniques that any horse can be shod without too much difficulty. "Most horses are gentle," he says. "At least it is a rare horse that will try to hurt a person. Their natural tendency is to try to get away."

When a horse will not stand still, his foot must be tied up or he must be thrown and tied down. If the horse has to be thrown, a bale of hay can be lodged between his legs to keep them in position for shoeing.

Wiseman adds that whenever possible it is best to keep the horse on his feet. This gives him a chance to learn about the business of being shod so that he will be easier to shoe each time. Something like people. ☐

Author's Note: Material for this article was drawn from discussions with Robert Wiseman and from his book, "The Complete Horseshoeing Guide," published by the University of Oklahoma Press at Norman. ☐

A modern horseshoer takes his portable blacksmith shop with him.



Wiseman shapes an iron shoe to fit the horse's hoof.

Notes from the distaff side

JUST DESERT AND ROCKS

I WAS DESCRIBING family outings to two BLM recreation sites near Las Cruces in southern New Mexico, and a woman who heard me didn't see it my way. "All I found in the foothills of the Dona Ana Mountains was just more old desert and rocks," she said.

Later, I heard a Boy Scout say, "We still have to carry water when we camp in the Organ Mountains. But even so, the Aguirre Spring Recreation Site where we go, that's still the best campsite around." And from his mother: "Are there any rattlesnakes?"

A friend, planning a family outing, asked, "Is the road to Aguirre Spring paved? Can Grandma stand the ride and find a comfortable, shady spot? What's there to see?"

And I heard still a different point of view from a man who likes it rough and lonesome. "Why pave roads? That just lets more people into the back country, and they leave trash and spoil things." Of course, he owns a jeep, is in good physical condition, and obviously is not eager to have company in the more rugged areas of the public lands.

Now I feel that I'm right in the middle when the comments begin to fly about BLM developing those two recreation sites north of Las Cruces. On the one hand, my husband works for BLM; on the other, I enjoy recreation on the public lands just like other people do.

When I pass on to my husband some of the comments I hear, he has the answer to why this was done and why that hasn't been accomplished. And I understand that developments on the public lands can't always be do[illegible] overnight and to everyone's immediate satisfaction. There are problems like land exchanges, engineering studies, road contracts, and money that have to b[illegible] taken care of, as well as that most essential problem of all: finding the proper balance between protecting and using the land and its resources.

So I leave the details and the problems to BLM, although sometimes I'm impatient like others. My family is part of the exploding population in southern New Mexico and we, too, have yearned for more developed recreation areas and better access to back country. But the experiences of our family's outings to the foothills of the Dona Ana's and to Aguirre Spring have taught us that, with or without some facilities and easy-traveling roads, the outdoors is a special place to be. And it's on the basis of those experiences that I express how I feel about the Dona Ana's and Aguirre Spring.

By **SHIRLEY GUMERT**
Las Cruces, N. Mex.

Memories

To the woman who found just desert and rocks in the Dona Ana foothills, I made no reply at all. Three thousand acres of the foothills are proposed for a recreation area, but so far the only development is a county-improved road, and I couldn't lead her to expe[illegible] a Yosemite. But privately, I remembered more th[illegible] just desert and rocks.

Once our family watched a roadrunner hen trying to hide her 11 babies from us. We saw her gather them again and again under a creosote bush and then dart out to offer herself as a target for us, the hostile invaders. Under a sheltered ledge our children found a few pictographs, and I heard them wonder all the "who's and when's and why's" that it's possible to imagine about Indian paintings. And there was one August when heavy rains turned the foothills green and brought into bloom wildflowers we'd never seen before.

Just rocks? We've learned that rocks in the Dona Ana's are for climbing, for gathering into collections, for endless "pretend" games, and for shelter from the desert wind. I've found rocks for building campfires and to serve as picnic tables and chairs. Then one evening I sat still long enough to watch large rock formations project changing images of great beauty as the sunset's glow spread across the rincon—the amphitheater formed by nearby hills—and on to the adjoining flat and desolate land that early Spanish travelers called "Jornado del Muerto"—Journey of Death."

To those who mention the lack of water and the fair share of rattlesnakes, both in the Dona Ana's and [illegible] Aguirre Spring, I may answer lightly, "Well, [illegible]

springs in the Organ Mountains may run only some of the time, but the rattlesnakes always run from people when they can." More seriously, along with other newcomers to this area, I still miss lakes and rivers, and still dread dust and cactus, tumbleweed, and rattlesnakes. But the Boy Scout has the right attitude: "Aguirre Spring is still the best campsite around."

A Special Place

I think Aguirre Spring is special because after traveling less than 6 miles through semidesert along the BLM road off highway 70, you can picnic among granite boulders in the shade of oak and alligator juniper trees. Then you can follow deer trails along the canyons and soon be in groves of ponderosa pine. That's when this housewife can unwind, see beyond the hodgepodge of routine chores, and experience the dictionary meaning of recreation: refreshment of strength and spirits after toil.

I find the setting right for contemplating the past, present, and future. From the Aguirre Spring site I can see Baylor Pass. Confederate soldiers marched through it on July 27, 1861, to overtake Union forces who had abandoned Fort Fillmore southeast of Las Cruces. I can see part of San Augustin Pass, through which the Union forces traveled, and San Augustin Spring where they surrendered.

The signing of the Union surrender took place in a ranchhouse that I can see east of the spring. The present owners of the ranch, Mr. and Mrs. Jim Cox, have an appreciation of the area's history and a concern for its use. They cooperated with BLM on plans for the Aguirre Spring Recreation Site where they hold grazing allotments. They are also neighbors of White Sands Missile Range and former allottees on part of the range which now glistens with rocket test sites and radar towers.

Also in my line of sight is the new BLM road from highway 70 to Aguirre Spring. It's 20 feet wide and paved with gravel and, yes, it will bring in more people. Some will find fault or see only old rocks, and some will wish for developed facilities. Some will think other people shouldn't come at all, and some will carelessly leave their litter.

But if they give this country a chance, they'll quickly develop a special feeling of their own for it. They'll want to share it and keep it clean, and they'll want to just be there in the outdoors. That's when they, like most of the people who come to the Dona Ana and Organ Mountains, will find each visit a rewarding experience. After all, how many people have private backyards as big and beautiful as all outdoors? ☐

MINING AN

A resource of the public lands unique to Utah

At GILSONITE, COLO., some 12 miles west of Grand Junction, there's a small refinery that produces high-quality gasoline, industrial fuel oils, several grades of road oils, paving asphalts, and metallurgical coke. But then, other refineries in other parts of the country also produce such products.

What makes the Colorado refinery unusual is the basic material, called gilsonite, that it uses in the manufacture of its end products.

Gilsonite is a natural bitumen, solid in form and black in color with the appearance of coal. This bitumen, also called asphaltite, is brittle and breaks easily into a powder. It will not burn except at high temperature, and is light in weight, only slightly heavier than water. It dissolves readily in petroleum solvents such as kerosene, and it may be blended with oils and greases to produce softer or more fluid products.

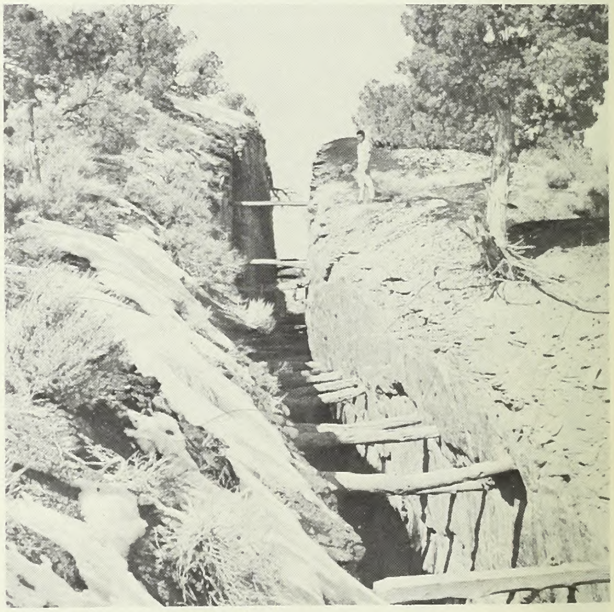
The gilsonite is mined on public lands in the Uintah Basin of Utah and Colorado, 72 miles north of the Colorado refinery. The mines, at Bonanza, Utah, tap the only known gilsonite deposit of commercial value in the world. Materials similar to gilsonite, but usually lacking some of its important characteristics, are found in Mexico and the Middle East, but few have been commercially produced.

With the discovery of gold in California in 1848, and the beginning of mining in Nevada, Colorado, and Utah, miners and prospectors swarmed over the mountainous West. Among them was Samuel H. Gilson who had been, at various times, a pony express rider, an Indian scout, and a U.S. deputy marshal. It is said that Gilson became intrigued by pieces of a shiny black material being carried by ants, and that by tracing their route he discovered a vein of the mineral which today bears his name.

By **GERALD A. HUFF**
Area Manager, Book Cliffs Resource Area
BLM District, Vernal, Utah

Origin Unknown

The origin of gilsonite is still a matter of speculatio One theory is that geologic movement forced liqui oil from oil shales and into rock fissures. The theory holds that the gilsonite reached its present state through



A mined-out gilsonite vein at the old Rainbow mines. This vein, mined with pick and shovel, was several miles long and, in places, 250 feet deep.

UNUSUAL MINERAL

a process of molecular rearrangement—this over a long period of time and without the aid of heat. Another theory is that only pressure and heat could have forced the oil from the shales and into the fissures, and that it was heat that converted the oil to gilsonite.

However it originated, the gilsonite in Utah is found in almost vertical fissures in rocks that vary in composition from sandstone to shale. These mineral veins range in width from inches to 22 feet, in length from a few miles to 30 miles, and in depth from a few feet to over 1,500 feet.

Early efforts to mine the new mineral were concentrated at Dragon and Rainbow, Utah, but these were generally unsuccessful—pick and shovel just couldn't do the job—and the two communities are now numbered among the ghost towns of the old West.

More modern and more successful mining of gilsonite [illegible]an in the early 1900's when the Barber Asphalt Co. [illegible]uired the properties of a company originally formed [illegible] Samuel Gilson and a St. Louis mining engineer, [illegible]. O. Baxter. Barber was successful in mining and marketing gilsonite, and the raw mineral was used in many products of the period. But in spite of hundreds of thousands of dollars spent in research, Barber was unsuccessful in commercially producing petroleum products from gilsonite.

In 1946 the Barber interests, now the Barber Oil Corp., and the Standard Oil Co. of California negotiated a joint ownership of the gilsonite properties and formed the present American Gilsonite Co. The new company eventually developed a capability of profitably manufacturing petroleum products—initially gasoline and coke—from gilsonite.

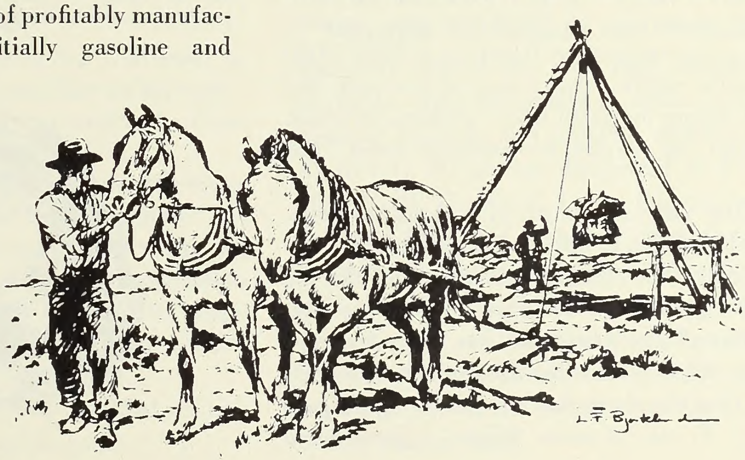
During the years from early efforts to more modern times, two of the several problems that had to be solved before gilsonite could be mined and marketed in quantities undreamed of by Sam Gilson were those of mining and transportation.

Mining the peculiar vertical veins of the mineral, for example, on a scale large enough to keep a refinery supplied, called for techniques far superior to pick and shovel. Through research and technology, the present-day hydraulic mining system using rotary cutting drills was devised. It has proved most effective.

Boring Machines

Mining a vein begins by sinking a vertical shaft from the surface of the vein to a depth of 850 feet or more. From the bottom of the shaft a drift, or tunnel, is driven horizontally along the length of the vein. Both shaft and tunnel are built by rotary drilling machines that bore holes more than 5 feet in diameter.

Drilling from the surface of the vein again, some distance from the shaft, a rotary drill bores a 6-inch hole down to the tunnel level where it is fitted with a special high-pressure water bit. Then, as the water bit is brought up slowly through the hole, it cuts loose the gilsonite in a surrounding 8- to 10-foot circle. The slurry thus formed of mineral and water falls to the tunnel below where it is gathered into a piping system and pumped to the surface. With this method, most of the work is done by water with few men underground.



[illegible]INAL DRAWINGS COURTESY OF
AMERICAN GILSONITE COMPANY

Once mined, the gilsonite had to be moved to market over the many miles of rough country that lay between the mines and the nearest railroad. In the early days, four-horse teams hauled the ore in wagons and trailers over the mountains to Price, Utah, where it was reshipped by railroad. From 6,000 to 7,000 pounds made a load, and the round trip took 10 or 11 days. On the return trip the wagons hauled supplies for the mines and for settlers. But as new uses for gilsonite were found, the ore was needed in quantities larger than the wagons could transport.

Construction began in 1903 of a narrow-gage railroad to connect the mines with the Denver & Rio Grande Railroad west of Grand Junction, Colo. The narrow-gage climbed over 8,500 foot Baxter Pass, and in its 53-mile length it crossed 75 bridges. The line had some of the sharpest curves and steepest grades in railroad history. The railroad served the mines and hauled freight into and out of the Uintah Basin until 1937 when steep grades and mounting costs of operation forced its abandonment in favor of truck transportation.

But even modern trucks could not transport the gilsonite in sufficient quantities. The refinery that had been built in Colorado required a continuous and large supply of the mineral to insure uninterrupted operation. Although 72 miles from the mines, the site of the refinery near Grand Junction was a choice location. The large supplies of water needed in refining operations were available, western Colorado was a ready market for gasoline, and the refinery's other products could be shipped to market over mainline tracks of the Denver & Rio Grande.

Forbidding Circumstances

To solve its mine-to-refinery transportation problem, the company finally turned to a pipeline. Solid material had never been transported by pipeline over long distances, and circumstances were forbidding: 72 miles of desert and mountains, an 8,500-foot pass, subzero winters, and a requirement to transport at least 1,000 tons of gilsonite reliably, every day, at low cost. But research and testing indicated that a pipeline, in which gilsonite would be carried by pumped water, was feasible.

So a pipeline was built, much of it along the roadbed of the old railroad, to span the rugged country between Bonanza and the refinery. Completed in 1957, the pipeline is designed for continuous flow and is shut down only after all slurry is flushed out. Electric pumps provide the 2,300-pounds-per-square-inch pressure necessary to keep the slurry flowing fast enough to prevent plugging. In case of power failure, a diesel pump automatically cuts in to flush the line. Baxter Pass p vides another safeguard. A reservoir there can flush the line by gravity in both directions.

When in full operation, the pipeline contains abo 1,500 tons of gilsonite suspended in 240,000 gallons of water. The slurry, moving about 3 miles an hour, takes 24 hours to reach the refinery.

At the present time, the company is producing 450,000 tons of gilsonite a year, and the mineral is used worldwide in an almost endless list of products. Examples include asphalt floor tile and roofing materials; soundproofing, sealing, and insulating compounds; protective coatings such as insulating varnishes, industrial and roofing paints, acid- and alkali-resisting paints, and asphaltic sealers and putty; molded products like battery boxes, electrical and mechanical parts, brake and clutch linings, and tubing; printing inks; and a variety of rubber products.

The company has also developed a number of new products that can be made from gilsonite such as paving materials and pavement sealers, specialty products for other companies, and insulation materials for buried pipelines.

All of these products serve useful, if somewhat prosaic, purposes and in themselves make gilsonite a significant resource of the public lands. But pros purpose or not, some of them in the future may beco as famous for a special use as have gilsonite produc of the past.

The last trans-Atlantic cable that was laid had a natural rubber-gilsonite compound in its protectve covering. The black paint on Col. Charles A. Lindbergh's Spirit of St. Louis, in which he made the first solo flight across the Atlantic, was baked-on enamel made from gilsonite. Henry Ford's Model T, which began the replacement of horse-drawn vehicles, was painted with gilsonite varnish. And even before that, the old-time surrey with the fringe on top remained shiny black for years because of the same gilsonite varnish. ☐

LAND LAW REPORT

The following news notes, compiled by the Public Land Law Review Commission, report the progress to date of the Commission's work.

Commission Announces Additional Contracts and Studies

Representative Wayne N. Aspinall, Chairman of the Public Land Law Review Commission, has announced additional contracts entered into for the preparation of manuscripts as part of the research program being carried on by and under the supervision of the Commission staff:

Public Land Policy and the Environment.—Four contracts were entered into to perform this study. Two contractors were Landscape, Inc., of Madison, Wis., and Steinitz, Rogers Associates of Cambridge, Mass., to provide a review of methods of environmental analyses for public land use decisions.

A review of legal and administrative systems was performed by Ira Michael Heyman, professor of law and of city and regional planning at the University of California at Berkeley; and Dr. Robert H. Twiss, associate professor in the department of landscape architecture at the University of California at Berkeley.

Contractor for an examination of environmental impacts was the Rocky Mountain Center on Environment (ROMCOE) of Denver, Colo. The report, a compilation of case studies on public lands, considered such environmental impacts as air quality, water quality, ecosystem changes, and alterations of scenic, wilderness, wildlife, fishery, historic, and outdoor recreation values and resources. Roger P. Hansen, ROMCOE executive director, was project director.

In addition, Prof. Hugh Davis of the University of Massachusetts served as a staff consultant on the study.

Objectives of the overall study, according to Commission Director Milton A. Pearl include:

1. Illustrations of how environmental alterations that result from a land use affect human welfare.
2. Analysis of existing public land policy to control adverse environmental effects to enable the Commission to determine the adequacy of policy and the laws implementing that policy and how, if necessary, such policies and laws can be improved.
3. Examination of the effects that modified policies could have on current uses of public lands.

Robert J. Lavell served as staff project officer for the overall study. A graduate of Georgetown University, Lavell was a member of the Research Division of the Bureau of Outdoor Recreation in the Department of the Interior before joining the Commission staff.

Land Acquisitions and Exchanges.—Contractor was Charles F. Wheatley, Jr., a Washington, D.C., attorney.

The study examined both the legal and operational aspects of Federal land exchange and acquisition programs. Indepth analyses centered mainly on four Federal agencies: Forest Service, Bureau of Land Management, National Park Service, and the Fish and Wildlife Service.

The examination included 20 case studies, tracing selected exchange and acquisition projects from the initial planning stage through completion.

The study was designed to provide data concerning such policy considerations as:

1. Are the acquisition and exchange procedures cumbersome? If so, can they be streamlined?
2. Do agencies have adequate acquisition and exchange authority to carry out their statutory directives?
3. Can satisfactory means be devised to prevent the escalation of land prices involved in Federal acquisitions?

Jerome C. Muys served as staff project officer for the study. Muys is Chief of the Commission's legal staff and Assistant General Counsel of the Commission.

Disposal Techniques and Procedures.—Contract was entered into with Prof. Raleigh Barlowe of Michigan State University to cover past and existing disposal methods and possible modifications thereof. Andrew C. Mayer was designated as the staff project officer, with Thomas C. Lee as associate project officer.

New Cities and Urban Expansions.—Two contracts were entered into to provide material for a staff study on the probable future demands of public lands for new cities and the expansion of existing communities. One contract was with Urban America, Inc., Washington, D.C., and the second was with Daniel W. Cook of San Ramon, Calif.

When Burl Ives stopped by Washington, he also met with employees of BLM's Washington Office. After speaking to his audience of "fellow workers" and telling them of his interest in working with the Johnny Horizon program, he stayed to talk with many employees individually and to give them his autograph.

This is a compilation of the most up-to-date information possible on up-coming sales of public lands by land offices of the Bureau of Land Management. For details of land descriptions, prices, and other information pertinent to sales, you must write the individual land office concerned. In most cases, there are adjoining landowners who have statutory preference rights and may wish to exercise them to buy the land. Sales notices will point out, insofar as possible, problems relating to (1) access, (2) adjoining owner preference rights, (3) small-tract sales limitation of one per customer, and other pertinent information. When possible, all sales are scheduled far enough in advance so ample notice can be given in Our Public Lands. Sales listed can be canceled on short notice for administrative and technical reasons. A listing of BLM land offices with addresses is found on the opposite page.

Key: A, acres; app, appraised; El, elevatio est val, estimated value; Cty, county; veg, vegetative; pot, potential; pub, publication cost, elec, electricity; tel, telephone; D.O., District Office; L.O., Land Office.

ALASKA

Public lands in Alaska are not available for sale at this time. Future public land sales will be announced in this space when scheduled.

CALIFORNIA

40 A, 12 miles south of San Andreas, Calaveras Cty. No surface water; power and tel nearby. Oiled Cty road crosses tract. App $8,000.

60.15 A, 22 air miles northeast of Redding, Shasta Cty. Within 10 miles of Lake Shasta and affords good view of Mt. Shasta and other peaks. Marginal stand of commercial timber. Good all-year spring. No public road access. App $6,000.

MONTANA

2 tracts, 200 A app $4,700 plus pub and 280 A a $4,480 plus pub, about 26 miles south of Chino

ine Cty. Isolated, on upper parts of mountainous terrain with steep slopes. Shallow soils of medium textured loams. No legal access; no road access. Sale after ay 15.

3 tracts: 2 tracts, 40 A each app $960 each plus pub and 1 tract, 80 A app $1,920 plus pub, 28 miles south of Chinook, Blaine Cty. Very hilly, almost mountainous. Loose, course-textured soils of volcanic origin with considerable rock scattered over surface. No water; no legal access. Sale after May 15.

80 A, 7 miles northwest of Redstone, Sheridan Cty. Varies from nearly level benchland on the west half to steeply rolling on the east. Silty soils with considerable gravel content on the steeper slopes. Access by private ranch trail; intermittent stockwater available. App $1,875 plus pub. Sale after May 15.

2 tracts, 40 A each app $760 each plus pub, 55 air miles southeast of Miles City, Custer Cty. Rolling grazing land; no stockwater. Access via private ranch trails. Sale after May 15.

NEVADA

44.57 A, 2 miles southwest of Elko. Near U.S. 40 and proposed interchange. Suitable for residential or commercial development. Land is on gentle bench overlook- Humboldt Valley; utilities nearby. Open space ning. Vegetation is sagebrush and grasses. App 4,500. Sale at Elko D.O., 1 p.m., June 9, 1970.

80 A, 45 miles northwest of Winnemucca, Humboldt Cty. Gently sloping; heavy clay soils. Vegetation is salt desert shrub. Suitable for agricultural development. Legal access across public domain; physical access by ranch roads. App $2,000. Sale at Winnemucca D.O., 10 a.m., May 25, 1970.

5 A, 1½ miles from California-Nevada State line, near Topaz Lake in Douglas Cty. Land crossed by Highway 395 whose right-of-way covers all but about 1½ acres of sale tract. Physical and legal access; utilities nearby. Gently sloping; vegetation is sagebrush and pinon pine. App $3,000. Sale at Reno L.O., 2 p.m., May 20, 1970.

NEW MEXICO

7 tracts, 40 A to 120 A, 13 to 15 miles southwest of Kenna, east-central portion of Chaves Cty. Moderately rolling with sand hummocks. Thin to moderate depth of sandy soil covered with moderate density of vegetation. Best suited for livestock grazing. Power transmission line passes through 2 tracts. App $10 to $13 per A.

2 tracts, 160 A each, 12 to 13 miles south of Deming, Luna Cty. Level with sandy loam soils. Suitable for al homesites; tel and elec. App $50 per A.

4 tracts, 40 A to 160 A, 2 to 3 miles north of Alamogordo, Otero Cty. Level with gravelly sand surface underlain by deep strata of red clay. Tel and elec. App $50 to $100 per A.

2 tracts, 192.84 app $8,700 and 1,280 A app $50,000, 25 miles south of Santa Fe, Santa Fe Cty in area slightly influenced by rural development. Elec 1 to 1½ miles. Pinon-juniper woodland. Moderately rolling to rough and broken mesas interspersed with deep canyons and dry washes; picturesque. El 6,000 to 6,400 feet. No legal access; physical access from Cty road via 4 miles of private ranch trailroad.

OREGON

161 A, near Hermiston in northern Umatilla Cty. Irrigated; agricultural and commercial development plot. Level to gently rolling; vegetation is native grasses. I–80N bisects tract and railroad borders tract on north side. Write Oregon L.O. for details.

WYOMING

40.61 A, in Bighorn Cty north of Dry Creek. Extremely rough and mountainous; permanent stock water. No legal access. App $800. Sale after May 1. Write Wyoming L.O. for details.

Bureau of Land Management Land Offices

ALASKA:
555 Cordova St.
Anchorage, Alaska 99501
516 Second Ave.
Fairbanks, Alaska 99701

ARIZONA:
Federal Bldg., Room 204
Phoenix, Ariz. 85025

CALIFORNIA:
Federal Bldg., Room 4017
Sacramento, Calif. 95814
1414 Eighth St.
Riverside, Calif. 92502

COLORADO:
14027 Federal Bldg.
Denver, Colo. 80202

IDAHO:
323 Federal Bldg.
Boise, Idaho 83701

MONTANA:
(N. Dak., S. Dak.):
Federal Bldg.
316 North 26th St.
Billings, Mont. 59101

NEVADA:
Federal Bldg., 300 Booth St.
Reno, Nev. 89505

NEW MEXICO (Okla.):
Federal Bldg.
Santa Fe, N. Mex. 87501

OREGON:
729 Northeast Oregon St.
Portland, Oreg. 97232

UTAH:
Eighth Floor, Federal Bldg.
125 South State St.
P.O. Box 11505
Salt Lake City, Utah 84110

WASHINGTON:
729 Northeast Oregon St.
Portland, Oreg. 97232

WYOMING (Nebr., Kans.):
2120 Capitol Ave.
Cheyenne, Wyo. 82001

ALL OTHER STATES:
Robin Bldg.
7981 Eastern Ave.
Silver Spring, Md. 20910

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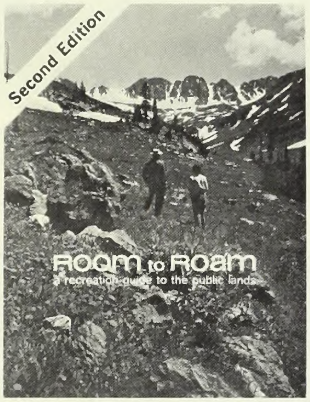

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